

Claims

WHAT IS CLAIMED IS:

1. An automated method for delivering a private line in a communication network to a customer comprising the computer implemented operations of:

5 provisioning components in the network to provide a private line design;  
validating the private line design produced by the provisioning operation;  
retrying the provisioning operation and the validating operation, if the private line design  
is not valid;  
configuring the network to build a private line circuit in accordance with a private line  
10 design that is valid.

2. The method of claim 1 further comprising the operations of:

testing the private line circuit for failure;

if testing operation detects a failure in the private line circuit, retrying the provisioning  
operation, the validating operation and the configuring operation to build a new private line  
5 circuit.

3. The method of claim 2 further comprising the operations of:

detecting availability of the components in the private line design; and

retrying the provisioning operation, if one or more components are not available.

4. The method of claim 1 further comprising the operations of:

finding an optimal route;

said provisioning operation provisioning the private line design based on the optimal  
route.

5. The method of claim 4 further comprising the operations of:

testing the capacity of the optimal route;

retrying said finding and capacity testing operations if the optimal route does not have the  
capacity to provide the private line.

6. The method of claim 5 further comprising the operations of:

testing the private line circuit for failure;

if circuit testing operation detects failure in the private line circuit, retrying the finding  
operation, the provisioning operation, the validating operation and the configuring operation to  
5 build a new private line circuit.

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7. An automated system for delivering network service in a communications network, the automated system comprising:

a routing engine finding an optimal route for the network service;

a provisioning system creating a circuit design of network components for the route and

5 assigning the network components based on network records;

a service management system configuring and activating network components in the design based on actual network components in the network;

a command control engine controlling the routing engine, the provisioning system and the service management system to deliver the network service; and

10 said command control engine, if bad network components are detected during provisioning or configuring, controlling the routing engine, the provisioning system and the service management system to retry delivering the network service with another route and circuit design.

8. The system of claim 7 wherein the routing engine comprises:

a test module detecting a limiting element in the optimal route that limits delivery of the network service;

a mark module marking the limiting element as not useable;

5 a retry module initiating the routing engine to find a new route if the test module detects a limiting element.

9. The system of claim 7 further comprising:

a reconciliation system automatically fixing conflicts between network records and actual network components.

10. The system of claim 7 wherein the command control engine further comprises:

a validating module validating the circuit design against the network records and indicating a bad network component that can not be validated;

a mark module marking the bad network component as unavailable; and

5 a retry module initiating the routing engine to find a new route without the network component marked unavailable if the validating module indicates a bad network component.

11. The system of claim 7 wherein the service management system further comprises:

a fault/inventory system comparing the circuit design against a live inventory of network components in the actual network and indicating an error in the circuit design if a component in the circuit design does not match a component in the live inventory; and

a purge module purging the circuit design if said fault/inventory system indicates an error.

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12. A method for installing network service in a telecommunications network comprising the computer implemented operations of:

creating a design for a private line through the network to provide the network service;

5 validity testing the design against an asset inventory of network records to detect bad ports or segments in the design;

repeating the creating and validating testing operations if a bad port or segment is detected;

10 error testing the design against a live inventory of the network to detect errors in the private line design; and

configuring a private line in the network from the design if no errors are detected in the design; and

15 restarting the installation method at the creating operation if an error is detected in the design whereby the installation method automatically configures a private line if the design is valid, and automatically retries if the design is not valid.

13. Method of claim 12 wherein said creating operation further comprising the operations of:

finding an optimal route for the private line; and

creating the design based on the optimal route for the private line.

14. The method of claim 13 further comprising the operations of:

testing the optimal route found by said finding operation and detecting limiting network elements in the optimal route;

marking the limiting network elements as unavailable; and

5 retrying the finding operation to find a new optimal route without the network elements marked unavailable.

15. The method of claim 13 wherein said configuring operation further comprises the operation of:

activating network elements and segments to build the private line.

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16. In a telecommunications network having network components configurable from a network service management system, an installation method for installing a communication line to satisfy a network service request comprising the computer implemented operations of:

finding an optimal route to satisfy the required capacity in the service request;

5 provisioning and assigning the network elements and connections to implement a circuit design according to the optimal route;

validating the circuit design against an asset inventory of the network and indicating whether or not the circuit design is valid;

if the circuit design is not valid, marking bad network components in the circuit design

10 and retrying the installation method without the bad network components;

completing the circuit design if the circuit design is valid;

15 configuring an actual circuit in the network to implement the circuit design and thereby install the communication line;

testing whether there is a failure in the actual circuit in the network and indicating

whether the actual circuit has failed; and

if the actual circuit has failed, releasing good segments for use in subsequent circuit designs and retrying the installation method.

17. The method of claim 16 wherein the operation of finding an optimal route contains a retry loop so that when the routing operation checks a network element and the element does not have required capacity, the routing operation will mark the network element  
5 and retry finding an optimal route without the marked network element.

18. Apparatus for delivering network service in a communication network in response to a network service request, the apparatus comprising:

means for provisioning and assigning network elements and segments of the network to a  
5 circuit design for the network service;

validity means for testing the circuit design and consuming bad ports and bad segments in the circuit design;

means responsive to said validity means for retrying said means for provisioning and said  
validity means to provision, assign and test a circuit design that does not contain bad segments  
10 and bad ports and is a validated circuit design;

means responsive to the validated circuit design for configuring network elements and segments to provide the network service.

19. The apparatus of claim 18 wherein said means for configuring further comprises:  
error test means for testing the validated circuit design against actual network elements  
and segments to detect errors in the validated circuit design;

means responsive to said error test means if an error is detected, for releasing good  
5 segments in the validated circuit design; and

means responsive to said error test means if an error is detected, for retrying said means  
for provisioning and said validity means to provision, assign and test a circuit design that does  
not contain bad segments and bad ports and is a validated circuit design and for retrying said  
means for configuring to provide the network service.

20. The apparatus of claim 19 wherein said validity means tests the circuit design against an asset inventory database of network records of network elements and segments.

21. The apparatus of claim 20 wherein said error testing means tests the validated circuit design against a live inventory database of actual network elements and segments.

22. The apparatus of claim 21 further comprising:  
means for reconciling differences between the asset inventory database and the live  
inventory database.

23. The apparatus of claim 18 further comprises:

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means for finding an optimal route;

said means for provisioning the circuit design based on the optimal route.

24. The apparatus of claim 23 wherein said means for finding comprises:

capacity means for testing the capacity of the optimal route and marking network elements limiting the capacity;

means for initiating a retry by said means for finding to find an optimal route without

5 network elements marked by said capacity means so that an optimal route is found with a capacity to satisfy the network service.

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